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TRENDS IN SHAPING THE FUTURE OF GLOBAL PORTS : IMPLICATIONS TO DISASTER RESILIENCE FROM A MARITIME BIOETHICISTS PERSPECTIVE



**Prof. VAdm Eduardo Ma R Santos, AFP
(Ret)**

PRESIDENT

Maritime Academy of Asia and the
Pacific (MAAP)

Mariveles, Bataan, Philippines

Prof. Angelica M Baylon, PhD

Director for External Relations
Maritime Academy of Asia and the
Pacific (MAAP)

Mariveles, Bataan, Philippines

ABSTRACT

The information and data generated from various readings of the **Philippine Port Authority (PPA)** report, internet search, documentary and content analysis, observations and interviews conducted, were analyzed and categorized to

SEVEN SUPER "S" TRENDS (SSST OR 7ST)

for easy recall. The SSS-T that would shape the future of global ports is summarized into Seven Super "S" Trends or 7S-T namely :

1. SIZE AND SPECIALIZED SHIPS
2. STEMS AND SKILLS
3. SPEED
4. SUSTAINABILITY
5. SMARTNESS
6. SAFETY AND SECURITY
7. SCARCITY AND SUPPLY

With the 7ST comes the 19NR or nineteen new recommendations which may apply to both ARAB (specifically Egypt) and ASEAN (specifically Philippine) ports.

NINETEEN NEW RECOMMENDATIONS (19NR)

The (19NR) are in response to 7ST, believed to be the same trends and recommendations that are observed by global port experts although it may come in different terminologies and interpretation.

INTRODUCTION

PORTS

- constitute an important economic activity in coastal areas
- are also important for the support of economic activities in the hinterland or neighborhood since they act as a crucial connection between sea and land transport
- as a supplier of jobs, ports do serves in economic and social functions.

The need for infrastructure is one of the greatest global challenges of our time.



International
Labour
Organization

“For every USD \$1 Billion spent on infrastructure 200,000 direct jobs are created”



” A sustained increase in public infrastructure spending to 5% of GDP would add a total of 5-6% to GDP after 15 years”.

INTRODUCTION

The Marine Port and Service Market Report 2018-2023:



Trends, Forecast and Competitive Analysis shows that the global marine port and service market is expected to reach an estimated \$87.8 billion by 2023 and it is forecast to grow at a CAGR of 4.2% from 2018 to 2023.

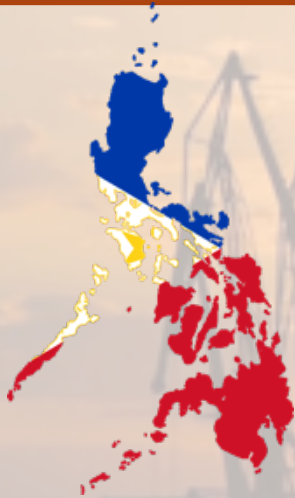


Major ports are certainly important conduits for the movement of trade and commerce both local and international.

Alexandria port is one of the oldest & largest ports in Egypt, It deals with over than 60% of the import & export trading activities that passes through Egypt every year.



INTRODUCTION

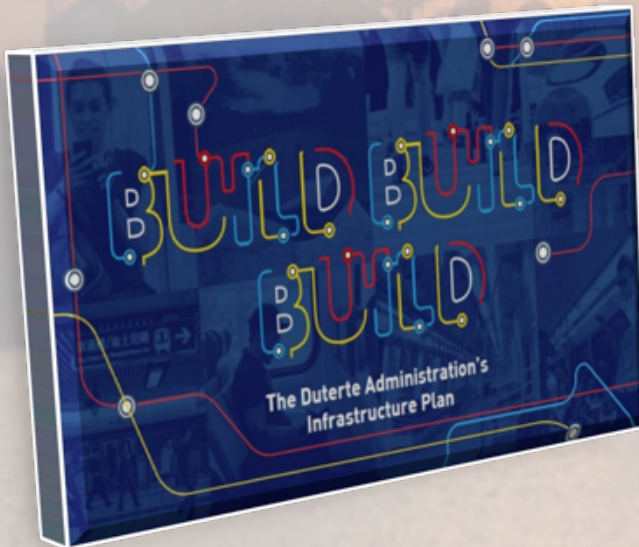


In the Philippines, the Manila port located in Tondo area facing the Manila Bay is the largest and the premier international shipping gateway to the country.

The PPA

a government-owned corporation, manages the Port of Manila and most of the public ports in the country. It is composed of 3 major facilities namely **Manila North Harbor, Manila South Harbor and the Manila International Container Terminal (MICT).**

PHILIPPINE
PORTS
AUTHORITY



On July 11, 2018 (44th Anniversary of PPA), the Philippine Ports Authority (PPA) announced that PPA is making a big investment regarding port infrastructure in its bid to achieve its vision by 2020.

The action is in line with the current thrust of the Duterte administration of **"Build, Build and Build"** to realize the golden age of infrastructure and be at par with international partners.



INTRODUCTION

Incidentally, the move is also parallel to one of the major programs of the International Maritime Organization (IMO) of building better ports for the future. PPA General Manager Jay Daniel R. Santiago said the focus of the infrastructure projects include full containerization of Philippine ports and the provision of larger backup areas; safe and convenient Passenger Terminal Buildings (PTBs); upgrade and construction of cruise terminals in key cities nationwide.

Seaports in the Philippines	
Luzon	Manila (Port Area, Manila) • Subic Bay (Subic, Zambales) • Abra de Ilog (Abra de Ilog, Occidental Mindoro) • Anjouw (Magdwang, Romblon) • Batangas (Batangas City, Batangas) • Iloilo (Iloilo, Negros Occidental) • Cagayan (Cagayan, Oriental Mindoro) • Cavite (Cavite, Marikina) • Laoag (Laoag, Ilocos Norte) • Legaspi (Legaspi) • Lucena (Lucena) • Port of Odiongan (Odiongan, Romblon) • Puerto Princesa (Puerto Princesa) • Romblon (Romblon, Romblon) • Davao (Davao, Oriental Mindoro) • Camarines (San Jose, Occidental Mindoro) • Sual (Sual, Pangasinan)
Visayas	Banaga (Bacolod) • Bantale (Bantale, Bohol) • Bato (Bato, Cebu) • Baybay (Baybay, Leyte) • BREDCO (Bacolod) • Calbayog (Calbayog, Samar) • Cebu (Cebu City, Cebu) • Danao (Danao, Cebu) • Dumaguete (Dumaguete, Negros Oriental) • Dumarog (New Washington, Aklan) • Dumangas (Dumangas, Bohol) • Escalante (Escalante, Negros Occidental) • Getafe (Getafe, Bohol) • Guimaras (Guimaras, Negros Oriental) • Hagay (San Remigio, Cebu) • Hilongos (Hilongos, Leyte) • Iloilo (Iloilo City) • Jagna (Jagna, Bohol) • Jordan (Jordan, Guimaras) • Larena (Larena, Siquijor) • Liloan (Santander, Cebu) • Liloan (Liloan, Southern Leyte) • Mactan (Mactan, Southern Leyte) • Naval (Naval, Biliran) • Ormoc (Ormoc) • Parang (Parang, Leyte) • Pulopandan (Pulopandan, Negros Occidental) • Cebu (Cebu, Cebu) • San Carlos (San Carlos, Negros Occidental) • Sibuyan (Sibuyan, Negros Oriental) • Tacloban (Tacloban) • Tagbilaran (Tagbilaran, Cebu) • Tagbilaran (Tagbilaran, Bohol) • Tampi (San Jose, Negros Oriental) • Tandayag (Tandayag, Negros Oriental) • Toledo (Toledo, Cebu) • Tugon (Tugon, Bohol) • Ubay (Ubay, Bohol)
Mindanao	Benoni (Mahinog, Camiguin) • Davao (Davao City) • Dipolog (Dipolog, Zamboanga del Norte) • Zamboanga (Zamboanga City) • Cagayan de Oro (Cagayan de Oro) • General Santos (General Santos) • Iligan (Iligan) • Jaram (Jaram, Misamis Occidental) • Marikina (Marikina, Lanao del Norte) • Nasipit (Nasipit, Agusan del Norte) • Oroquieta (Oroquieta, Misamis Occidental) • Ozamiz (Ozamiz, Misamis Occidental) • Pagadian (Pagadian, Zamboanga del Sur) • Pandi (Pandi, Misamis Occidental) • Puluan (Puluan, Zamboanga del Norte) • San Jose (San Jose, Dinagat Islands) • Surigao (Surigao City, Surigao del Norte)

The Philippine Port Industry is constantly evolving and innovating. Globalization and containerization have reshaped the port industry.

INTRODUCTION

On the other hand, Philippine Port, the **ASIAN** Port Industry is constantly evolving and innovating. Globalization and containerization have shaped the port industry.

Looking at Philippine ports, there are **7** Super Trends identified namely:

- **SIZE**
- **SPECIALIZED SHIPS**
- **STEMS and SKILLS**
- **SPEED**
- **SUSTAINABILITY**
- **SMARTNESS**
- **SAFETY and SECURITY**
- **SCARCITY and SUPPLY**

These 7 super trends have direct impact on the dynamics of the marine port and service industry.

During the last decades, globalization and containerization have reshaped the maritime and port industry and continue to present challenging changes.

Having outlined the seven super trends or 7ST that may apply to ports ; hence 19 new recommendations (19NR) under each super trend (7ST) for the port productivity are advanced:

SEVEN SUPER TRENDS (7ST) & NINETEEN NEW RECOMMENDATIONS (19NR)



(1) SIZE AND SPECIALIZED SHIPS (SSS) TREND

- The trend of the increasing size of ships, trains, and trucks is expected to continue in the next 15 years.
- The largest vessels, such as the 22,000-TEU ships, for example, can only call at a limited number of ports.
- Larger vessels require more depth, wider docks, stronger quays, and larger cranes. Implementing major infrastructural projects typically takes 15 years.

In 2018, the Manila South Harbour, Batangas Port and Subic Port on separate occasions in the Philippines had handled **the biggest and largest cruise ship** to dock in the Philippines...

underscoring its readiness to accommodate the demands of the booming industry for the Philippines. MS Ovation of the Seas is by far heavier and longer by 17,336 gross tons and 12.65 meters than MS World Dream, the erstwhile largest cruise ship that docked on Philippine waters.



MS Ovation of the Seas operated by Royal Caribbean International



MS World Dream run by Gentling Hong Kong, Ltd



(1) SIZE AND SPECIALIZED SHIPS (SSS) TREND

1. NEW STRATEGIC ACTION PLANS CREATED

As Ships have been getting bigger and bigger over the past decades and becoming a continuing trend, there is a need to **create new plans to increase the quality and quantity of the current fleet available.**

The plan must also include development of career pathways and training programmes that must become standards curriculum. The plan must include forecast of needs on labour and skills for the country to become a world class economy incorporating the infrastructure, framework and peripherals that lie beside in support.



2. NEW SPECIALISED SHIPS

Until a few years ago, container seemed to be the only way of transporting cargo. Today several shipping companies need to invest in specialized ship types, mostly in the heavy lifting industry and transportation of chemicals to cope with the changing times.



(2) STEMS

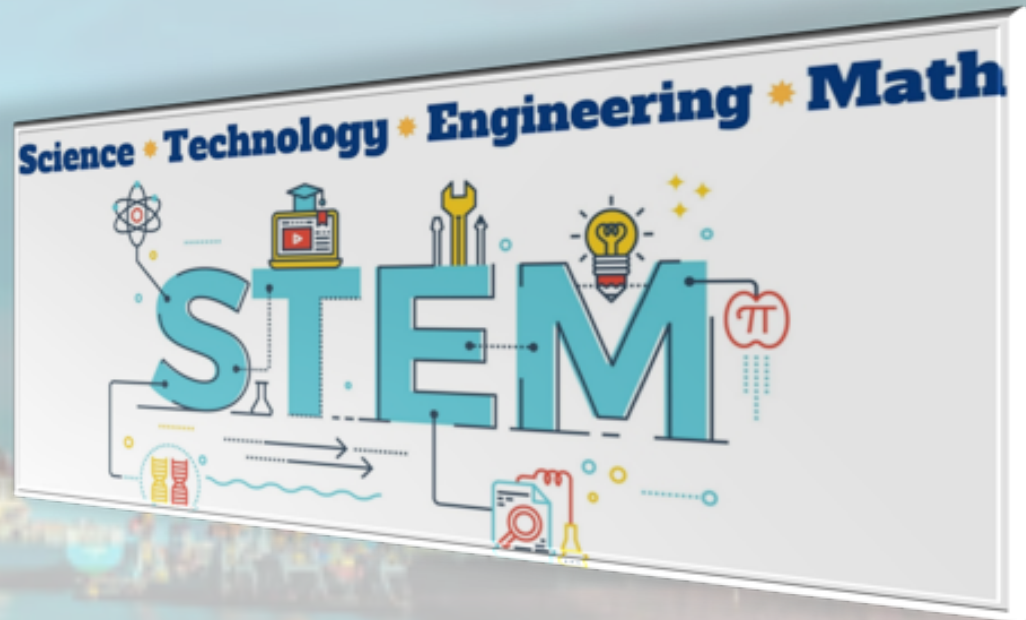


In the Philippines, **STEM track is required for maritime students**. STEM students are envisioned to become more and more sought after.

Competition for skilled employees is increasing, and as a result, the (port) labor market will further internationalize in the next few years.



STEMS profile as a priority in a knowledge intensive labor market for the port sector. **Knowledge and innovation** will become increasingly dominant factors in determining the competitive strength of the port.



3. NEW LEVELS OF SPECIALIZED KNOWLEDGE and SKILLS

about the ships and trade are needed by the crews with STEMS background to adapt to the extremely specialized ships constructed and made available worldwide.

(3) SPEED



Time is money. This is also true for ports wherein precise planning of processes and operations is even more important given the enormous impact of the tides and the costs for dockage.



The Philippines is currently investing in land transportation to ensure goods are moved out of our ports and delivered to the end. There is plenty of room for consolidation in the local shipping and logistics industry.



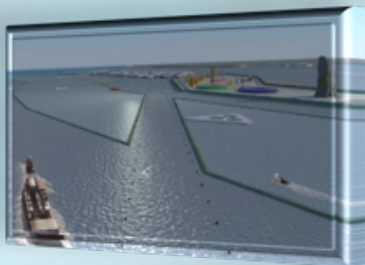
At present, the country has more than 12,000 domestic merchant vessels operated by thousands of companies and individuals, according to data from the Maritime Industry Authority.



We see the benefits of consolidation, as it would entice companies to come together to form more efficient operations and offer better quality service.



(3) SPEED



4. NEW NETWORK LAYOUTS

are needed to optimize the network for the final destination and to use additional vessels to maintain service frequency and speed because the use of VLCS, would impact the shipping network like longer round trips and reduction of ports called in a round-trip service.



5. NEW EMERGING MARITIME TRANSPORTATION ROUTES

must be identified to shorten the sea route distance for faster and cost-effective cargo handling and delivery or transport of goods



6. NEW ALLIANCES and MERGES

must be explored among shipping lines like that of 2M, Ocean Alliance, Grand Alliance, and New World Alliance to avoid loss of billions of dollars in the container market caused by increase oil cost; low freight routes and high capital investment



7. NEW MODES or SUBSTITUTION OF MODES

Combining maritime with air cargo, for example, would be 50% faster than maritime shipping and 50% cheaper than air cargo.



(4) SUSTAINABILITY



Environmental regulation becomes more comprehensive and more stringent. Ports could distinguish itself more clearly from other industrial locations by focusing on energy efficiency, recycling of residual materials and carbon capture, storage and reuse – in addition to that promoting itself in the global landscape.

It is necessary for ports to be green for them to retain their 'license to operate'.

One of the most significant breakthroughs in the Philippine maritime industry is green shipping. The country's efforts on the subject include activities sponsored by the IMO.



In February 2018, under its Global Maritime Energy Efficiency Partnership project with the United Nations Development Program and the Global Environment Facility, IMO sponsored a workshop participated in by 30 maritime educators.



The workshop—the second of its kind in Asia—aimed to equip them with knowledge on **ship-energy efficiency**, which they can include in their curriculum.



(4) SUSTAINABILITY

On 3 December 2018, the Philippine Ports Authority (PPA) is stepping up its **'green port'** initiatives in all its ports nationwide after two of the country's top gateways were conferred with GPAS awards by the APEC Port Services Network (APSN).



The Port of Batangas and the Port of Cagayan de Oro received their respective GPAS awards from APSN recently. The Green Port Award System (GPAS) program is a green evaluation system for ports in the APEC region.

Meanwhile, Batangas and Cagayan de Oro ports are certified to ISO 9001:2008 and recognized for its implementation of the Port Safety, Health and Environmental Management System (PSHEMS).

The two ports have migrated to the Integrated Management System (IMS) that covers three international standards, namely:

1. **ISO 9001:2015** (Quality Management System)
2. **ISO 14001:2015** (Environmental Management System)
3. **OHSAS 18001:2007** (Occupational Safety and Health)



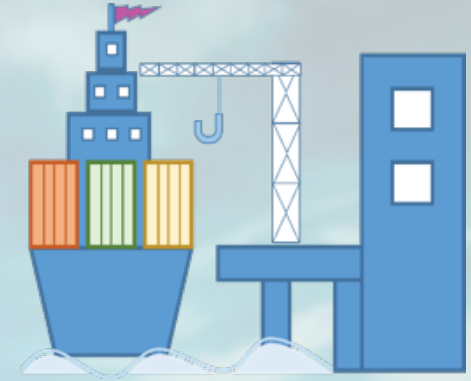
(4) SUSTAINABILITY

The program is intended to

- improve environmental awareness and
- increase the understanding of green port development strategy

With the aim of :

- achieving a balance between economic development and environmental protection in the APEC ports community;
- promote the sustainable development of ports in the APEC region and protect the port environment for the benefit of the entire APEC community
- contribute to the harmonization of regulations and improve interoperability of green port systems in the APEC region;
- establish an APEC green port performance benchmark based on this program, and share best practices and encourage mutual assistance among APEC ports.



**Asia-Pacific
Economic Cooperation**



(4) SUSTAINABILITY

8. NEW INNOVATION IN ENVIRONMENTAL AWARENESS

to increase focus on green image and to reduce the environmental footprint of port operators thru Onshore power supply (Innovative systems to provide electricity for the local grid to ships to meet their power demand).

Ship operations can proceed uninterrupted while eliminating negative side effects); LNG and new engines already fuel some seagoing vessels are being developed and the use of **Renewable Energy (RE)**.

There are six sources of RE :

- **B**iomass
- **G**eothermal
- **S**olar
- **H**ydrothermal
- **O**cean
- **W**ind



Ports need to capitalize on them depending on the country's available RE sources, to contribute on green shipping.



(5) SMARTNESS

There is a need to capitalize on modern technology to move toward computerization of systems and processes for greater productivity, removal of bureaucracy and combat corruption new technologies and innovations, such as the Internet of Things, will optimize the flow of information and goods.



“All devices will be interconnected and communicated with each other.”

Other countries are using Block chain Technology to minimize the need for third party certification and verification of transactions. **MAAP is the first to pilot test the block chain technology in the Philippines with Navozyme Company.**



→ which may be replicated by PPA, MARINA and other maritime industry.



In addition to these advances, port re-developments in Clark and Subic Bay are expected to increase handling capacity and promote the cruise line industry.



(5) SMARTNESS

9. NEW INNOVATION IN PORTS

is needed for an efficient container terminal thru Automation of port operations; Space efficient terminals; High-speed operations and Safety training and simulation

10. NEW PORT COMMUNITY SYSTEMS (PCS)



Interoperability is needed to improve the efficiency of port operations thru flexible and fast exchange of communication (with shipping agents, shipping companies, freight forwarders, terminal operators, carriers, customs administrations harbour master, government agencies, port authorities et al.)

There is a need for :

1. **Port gate automation**
2. **ICT and network relations** (*must be increased between transport operators*)
3. **Coordination of a community via standards-based communication** (*optimizes, manages and automates logistics processes not only pertaining to maritime shipments but with a multimodal scope*)

At :



National level (Egypt or Philippines for example) into a regional level (Arab or ASEAN countries for example)

which increases operational efficiency of a trade; Carrier strategies and port cooperation require interoperability of PCS and PCS systems widespread in ARAB /ASEAN ports not just in big ports for its transformation into a SMART Port .



(6) SAFETY AND SECURITY

In addition to the ports of Batangas and Manila, the Philippines are in the process of procuring vessel traffic management solutions (**VTMS**) equipment to cover an additional five locations.

The long-term intention is to install appropriate VTMS facilities in most of the major ports to ensure that maritime safety is addressed.

The modernization and development of the ports of :

1. Davao-Sasa
2. Iloilo
3. Cagayan de Oro
4. General Santos
5. Zamboanga

are within the medium-term plans for the Philippine Ports Authority, and the route to their privatization will be thru public-private partnership arrangement, although different modalities are also being evaluated.

Maritime safety and security remain critical issues in the Philippines,



Based on the statistics MARINA compiled, **about 20 major maritime accidents** involving passenger-carrying ships were recorded between 2009 and 2014. What is more noticeable is that 19 of these vessels were imported as old ships and only one was built locally.

Marina and other relevant agencies, including financial institutions, **created a financing program to support and encourage the construction of new ships at local shipyards**

(6) SAFETY AND SECURITY

11. NEW RISK-AWARE CULTURE

must be established in ports. The use of various control systems and increasing automation in the port will reduce the risk of human errors.



Automation also will improve the reliability of the system, limiting the number of delays.

However, technology also has a dark side. For example, cybersecurity and cyber-resilience are becoming more important as a parallel development to automation.



Hence, there is a need to be prepared to deal with existing and emerging cyber threats from criminals, terrorists and enemy nation states that could shut down large pieces of the country's critical maritime transportation system. The preparation is not just technological – it requires building **a NEW RISK-AWARE CULTURE**

12. NEW VESSEL TRAFFIC SERVICES (VTS)

An additional important aspect that reinforces a port's viability is safety. **Installation of appropriate VTMS facilities** in most of the major ports would ensure maritime safety, and the use of VTMS also serve as a best practice in berthing management, environmental protection, and planning for cargo-handling operations.



(7) SCARCITY AND SUPPLY

Further globalization, demographic growth, and development of the world economy are expected to trigger **scarcity of natural resources** and **growth in global freight transport**.



Urbanization trend implies, ports have to be a stronger connection to the larger cities, the high-speed rail link proposed between **Port of Manila and Port of Batangas or Subic** is an example.

The plan's key recommendations include the development of an integrated, long-term national strategy for **supply chain and logistics**, which will detail schemes for necessary multimodal infrastructure, including a **robust nautical highway and roll-on/ roll-off terminal system** linking the entire country.

The plan also recommends an administrative agency for **supply chain and logistics** be created to ensure policy implementation and compliance, as well as reforms to streamline and standardize logistics policies under various government agencies.



REPUBLIC OF THE PHILIPPINES
NATIONAL ECONOMIC AND
DEVELOPMENT AUTHORITY

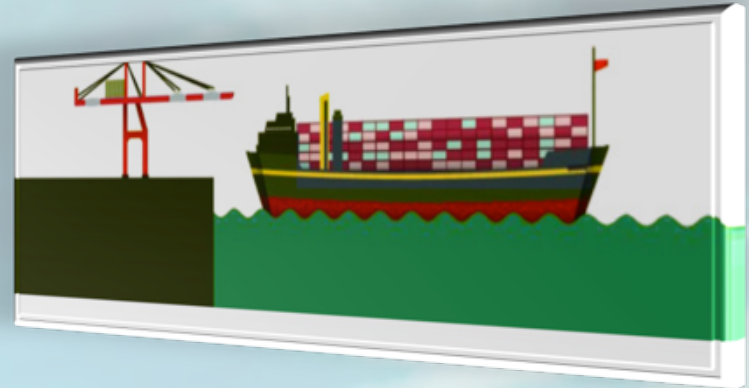
*which is responsible for approving all **public-private partnerships** in the transport sector, has also announced that **new port developments** remain an important prerogative.*



(7) SCARCITY AND SUPPLY

13. NEW EVOLUTION OF THE PORT

concept is from the interface between maritime transport and land transport to **LOGISTICS INDUSTRIAL ZONES (LIZ)** to be able to provide: IT Infrastructures; Integrated logistics Services and Value-added logistics services. Ports are changing and continue to evolve.



14. NEW POLICY ON PORT PRIVATIZATION



with the expansion of ports thru the private-public partnership (**PPP**), the structure of the port sector has changed. There are 3 main types of container terminal operators namely:

1. Port Authorities
2. Private Port Terminal Operating companies
3. Shipping lines

Egypt Ports similarly to Philippine Ports may have sufficient resources to turn a good number of ports in the country into world-class gateways, however subscribing to the PPP, instead of working all by itself, would build further resources to develop more ports and venture into new port infrastructure projects in other areas of the country.

(7) SCARCITY AND SUPPLY

15. NEW INVESTMENTS IN PORTS thru funding or financial program

To assist shipping companies in replenishing their fleet with modern vessels, as well as to help the local shipbuilding business flourish, relevant agencies including financial institutions must create a financing program to support and encourage the construction of new ships at local shipyards. The participating sectors shall have access to the subsidy included in the program.



16. NEW PORT PERFORMANCE INDICATORS



need to be developed for a renewed focus on efficient and service levels. Port performance indicators must be developed in addition to beyond monthly reports on cargo throughput; port performance dashboard; port performance benchmarks of terminals; port productivity rankings comparing ports around the world; port productivity improvement by increasing the number of moves per hour; and performance impact of the door-to-door supply chain.

17. NEW BETTER AND ADDITIONAL SERVICES PROVISION

needs to transform a maritime port to a multimodal hub. Examples are the inland waterways, hinterland railroad connections and extended gateway concepts that would respond to road congestion, increase the market for independent carriers and enhance supply chain efficiency. Regular and reliable train services to economic centres contribute to the attractiveness of ports.



(7) SCARCITY AND SUPPLY

18. NEW IMAGE OF THE BUREAU OF CUSTOMS

This is to encourage foreign investments and the Bureau of Customs major systems and procedures in order to make it more efficient and combat corruption.

The Philippines have been vigilant with its battle against corruption and inefficiency in the government and has instituted a national single window and link its databases with that of the Customs department in order to *improve risk management* and also has instituted automation in areas of Customs operation which are applicable for modernization, to prevent personnel in dealing with the public.



Egypt may also do the same as part of their battle to corruption committed by some of the arrested corrupt Egyptian officials.

19. NEW POLITICAL WILL AND STABILITY

There is a great possibility that given the status of the Philippines and Egypt as a developing industrialized maritime country, brimming with potentials, the advent of the **MARLOG 8** may bring forth foreign investments in ports, port infrastructure, and port operations. This would be very much dependent on the management and transparent good governance of the port leaders..



CONCLUDING REMARKS



For sure, there will be challenges and issues faced by the country's Ports that comes with 7ST in shaping the future of Global ports..

nevertheless

1. with the right systems and infrastructure in place
2. Along with the transparent governance and regional integration



The ports will be more than ready to welcome the opportunities and the **19 new recommendations (19NR)** that **the 7 super trends (7ST)** will bring forth to the country and the people..



ARAB countries like
Egypt

ASEAN Countries like the
Philippines

must, therefore, work together in their respective regions for regional growth and development for port progress and productivity.



CONCLUDING REMARKS

For regional integration, in addition to infrastructure development/port investment, Asian Countries Arab countries need the **6M** to be in place to ensure the success of regional integration :

M

MONEY

MATERIALS

MACHINERY

MANPOWER

MANUALS, MANUSCRIPTS or MODULES or MOUs

MANAGEMENT



The 6 M is needed to ensure that the 19NRs may be smoothly executed by the Arab (or Asian) countries in the spirit of **3 Cs (coordination, collaboration and cooperation)** among countries within the region.

Working jointly for regional growth, development and productivity in Ports based on the 7ST identified in shaping the Future of the ports either in the national, regional or global level.

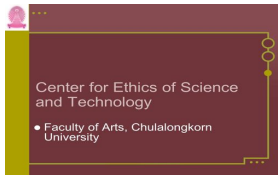


CONCLUDING REMARKS



Figure 1. Regional Integration for Railways, Port and Terminal Infrastructure and Investments

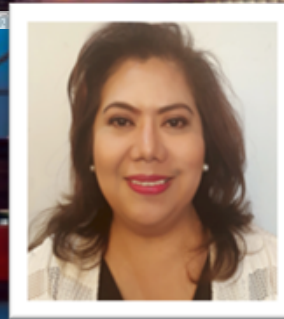




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